Earthwork Construction and the Organization of Hopewell Society

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The mounds and geometric enclosures of southern Ohio have fascinated scholars for two centuries, but many of the questions that sparked the interest of 19th-century antiquarians have yet to be fully addressed today. Contemporary scholars are proposing new and interesting interpretations about these impressive sites, but the sites themselves are disappearing. None of the great geometric enclosures has survived unscathed, and many of them can only be studied now by examining old aerial photographs or reading historic accounts. The need for field investigation of the remaining sites has never been greater.

Archaeological study of geometric enclosures in southern Ohio has been limited, with most work being focused on mounds associated with the enclosures. The large size of these sites has certainly served to deter excavations, and most studies have been limited to one or two summers of excavation. While these studies have generated useful information about some aspect of individual earthworks, none have generated a holistic view of any large geometric enclosure. Fortunately, geophysical survey instruments make it possible to map large areas; these data can be used to plan strategic excavations. The utility of this approach is illustrated by recent work on the rectangular enclosure at the Hopeton Earthworks, Ross County, Ohio.

Hopeton Earthworks is located north of Chillicothe. It was described by Squier and Davis as being a rectangle with an attached circle (Figure 1). The earthwork also has two smaller circles that were integrated into the north side of the rectangle and a pair of parallel walls that extend from the northwest corner of the rectangle 2400 feet to the southwest. The walls of the two larger enclosures were formed by a series of wall segments. Each was estimated to enclose 20 acres. The walls of the rectangular work were of monumental size, twelve feet high by fifty feet at their bases, and lacking a ditch on either side.

Geophysical Survey and Research Design

More than 150 years of cultivation have greatly reduced the walls of this enclosure, to the point where they are barely visible to the untrained eye. In 2001, the National Park Service initiated geophysical survey at Hopeton to determine if geophysical equipment could be useful in evaluating the subsurface composition of mounds and earthen walls. Reports in-progress elaborate on the geophysical studies; it should be noted here, however, that the efforts of John Weymouth, Bruce Bevan, Rinita Dalan, and Rolfe Mandel are producing exceptionally useful data.

The bulk of our survey efforts have relied upon a Geometrics G858 cesium gradiometer. The most important accomplishment was the discovery that the wall segments of the rectangular enclosure are distinctly visible in the magnetic survey data (Figure 2). The sharp boundaries on the interior and exterior of the wall segments are in marked contrast to the topography of these features, which is very gradual due to years of annual cultivation. The sharp magnetic contrast between the core of the wall and the surrounding soils of the landform suggested that the wall must have been constructed from soils that differ markedly from the natural soils of the alluvial terrace. In an effort to determine how much of the original wall was preserved at Hopeton, the geophysical survey data were used to select four locations around the rectangular enclosure for test excavations.

In 1996, Bret Ruby excavated a 1-m-wide trench across a wall segment at the northwest corner of the rectangular enclosure. Aerial photographs indicate this section of wall was preserved in a fence-row since at least 1938. The 1996 trench revealed that three different soil deposits were present in the wall, each representing a different stage of construction (Ruby 1997:3–4). Using this information, we developed a plan for testing other wall segments to determine whether we might be able to learn how and when they were built.

Trench Excavation Results

Field studies of the walls that form the rectangular enclosure were conducted from 2001 to 2003. Using the geophysical survey data to evaluate the potential preservation of the wall segments, we selected four

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locations in four different wall segments for trenching (Figure 2). Each trench was 1.5 m wide and varied in length from 41 to 50 m. Trench 1 was in the central segment of the southern wall of the enclosure. Trenches 2 and 3 were excavated through wall segments forming the western wall, and Trench 4 was excavated across the only curved wall segment that forms the northeast corner of the enclosure.

Examination of each of the trenches revealed that although there were some general similarities in the methods and materials used to build the wall segments, each wall segment was different. In each wall segment, construction was started with removal of topsoil to expose the subsoil. Two different subsoils are present on this landform. Yellow silt loam was exposed at the bases of Trenches 1, 2, and 3, and red sandy loam was exposed at the base of Trench 4. In each of the wall segments, the builders performed rituals that involved burning. These activities left small burned soil features with charred materials often at the interface of two different construction stages. Unfortunately, due to degradation from years of agriculture, we are only able to observe the first stages of wall construction that form the base of the individual wall segments.

The base of the wall segment exposed by Trench 1 was formed by piling up yellow silt loam similar to the subsoil, and then covering the top and outside of the yellow soil with a red sandy loam (Figure 3). In Trenches 2 and 3, a dark gray-brown silt loam was piled on the yellow subsoil to form the base of the wall. Then yellow or yellow-brown soil was piled on the east or inside of this dark material, and red or red-brown soil was placed on the west or outside of the wall segments. The configuration and colors of the materials used in these two segments are quite different, but the pattern of construction as just described is similar.

The contacts between the soil layers exposed in all three of these wall segments were generally distinct, suggesting that little time elapsed between the deposition of the different materials. To determine if this observation was valid, Rolfe Mandel conducted micromorphological analysis of sediments from Trench 1. This analysis indicates that no evidence of weathering or soil formation is present, and construction of the wall segment probably occurred in a few years or less (Lynott and Weymouth 2002:5).

The situation in Trench 4 is quite different from what was observed in the other trenches. Wall construction was initiated by stripping the topsoil and exposing the red sandy loam subsoil. The subsoil was then covered by a layer of dark gray loam with lenses of fine gravel. Dark gray loam was then deposited on the dark base to form the core of the wall segment. Red sandy loam was then piled on the south or inside of the dark core, and the contact between these two layers exhibits a sharp boundary. Gray-brown loam was deposited on the north side of the dark core, but the boundary between these two materials is not sharp. Numerous small lenses of different soil materials, which appear to represent basket loads, form a complex boundary between the two soil units (Figure 4).

Construction Methods and Episodes

One of the goals of this study is to determine when the walls of the rectangular enclosure were built. Fortunately, the people who built the wall segments conducted rituals that included burning wood and other materials in association with the various stages of wall construction. Four radiocarbon dates from features in Trenches 1, 2 and 3, plus two other radiocarbon dates obtained by Bret Ruby from his 1996 trench suggest these wall segments were probably built between AD 150 and AD 250.

Two radiocarbon dates were obtained from features in Trench 4, and they are both 800 years more recent than the dates obtained from the other trenches. Since one of the samples was taken from a feature at the very base of the wall segment, it seems unlikely that these represent intrusive episodes that postdate construction of the wall segment. When these dates are considered in association with the unusual construction methods recorded in Trench 4, it seems likely that this wall segment was either built many centuries after the other wall segments, or it was modified or repaired at this later time.

The work on the rectangular enclosure at Hopeton demonstrates that variation in wall construction methods, and even the age of wall construction, might be significant within individual earthworks. Understanding the methods and materials used to build these walls is important, because the amount of

energy that was invested is a reflection of the values, labor force, and social organization of the people who built the enclosure.

Study of the materials used to construct the walls at Hopeton indicates that all of the soil and gravel selected for this purpose was available on the landform where the site is located. The massive amounts of soil used to build the walls were quarried with hand tools and carried in baskets, and vast amounts of soil were moved all across the site. This substantial earthmoving resulted in the creation of a cultural landscape that was probably cleared of vegetation to facilitate gathering and moving soil around the site.

Rather than simply scooping up soil and piling it into an earthen wall, the wall segments at Hopeton were built with carefully selected soils. The entire process began by removing all topsoil from the area where a wall segment was to be built. The action of exposing the yellow or red subsoil certainly provided a very stable foundation for the wall segment, but it also probably was related to the Hopewell people's efforts to manage the spirit world. In the wall segments we examined on the south and west sides of the Hopeton rectangular enclosure, the wall builders always placed red soil on the side of the wall that would be viewed from outside the enclosure. Yellow soils were always placed on the side of the wall that would be viewed from inside the enclosure. The contacts between the different soils used to build these wall segments are sharp and clear, and it is obvious that the selection of soil and its placement in the wall was carefully engineered. These wall segments were all built about AD 200.

The curving wall segment that forms the northeast corner of this enclosure is quite different. In this area, the topsoil was removed to expose red subsoil, and this wall segment is constructed primarily of red sandy loam plus two different shades of gray loam. There are large homogenous deposits of these materials in the wall, but the contacts between the different soil materials are frequently marked by basket-loading. In this instance, red soil was placed to be visible from inside the rectangular enclosure and gray loam would have been visible from outside the enclosure. Of course, as time went by, and soil formed on the earthen walls, the wall colors would have become less noticeable. The variation we have noted in the color placement and construction methods between these wall segments might be related to some intended differences in function. However, the radiocarbon dates from the curved wall segment suggest that the curved wall segment was completed about 800 years after the other wall segments were complete.

Conclusions

As archaeologists and geophysicists continue to study the relationship between geophysical data and the archaeological record, it is apparent that this line of research will provide a more accurate depiction of the original placement and size of the wall segments than can be obtained from either current topographic maps or 19th-century historic maps (Figure 5). Recent interpretations suggest the placement of gateways at Hopeton and other Hopewell enclosures were planned to view solar and lunar events. Evaluation of these hypotheses can be accurately evaluated through large-scale geophysical mapping of these sites. Geophysical survey also provides an efficient and effective way to develop a holistic view of the archaeological record of these giant earthen monuments. This can be a particularly effective way to view large sites when done in concert with systematic surface collections and strategic testing efforts.

The timing of the introduction of these new technologies to the study of Ohio Hopewell is critical. Earthworks and mounds were once plentiful across all of southern Ohio. Urban growth, agriculture, and other development activities have damaged or destroyed nearly every single earthen monument in this region. The forces impacting the archaeological record continue to escalate as population grows, cities expand, and agriculture continues. A number of important sites have been purchased and preserved. Unfortunately, now that methods and technologies that permit effective study of these large sites are becoming available, the vast majority of large Ohio Hopewell sites are being erased from the cultural landscape. Increased efforts to preserve sites for future study are certainly needed, but more large-scale archaeological studies of these great places are also needed before they are lost forever.

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